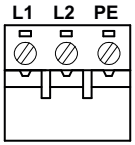
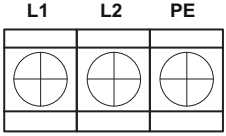
4. Inputs and outputs

4.1 Power supply

4.1.1 Power supply terminal board (230-460 V version)

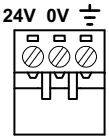


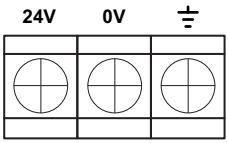


Terminal	Description
PE	Protection circuit breaker connection terminal (*****).
L1	Phase input 1
L2	Phase input 2

***Note** (*): the device can be installed in TT voltage distribution systems (i.e. domestic users in Italy), IT (to ensure maximum operating continuity) and TN (users with their own transformer cabin). Each of these systems provides different ways to ground the power source and the metal system masses.*

4.1.2 Power supply terminal board (24 V version)





Terminal	Description
⏚	Protection circuit breaker connection terminal.
24 V	Phase input 24 V
0 V	Phase input 0 V

4.1.3 Power supply wiring diagram

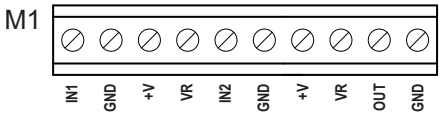
See "Power supply wiring" on page 24.

4.2 Analog inputs and outputs

4.2.1 Terminal board M1

Analog inputs for reading NTC current/voltage/resistance signals from sensors and transducers. Voltage outputs to power potentiometers, sensors and transducers. Analog output for regulating EC motors.

***Note**: MEI-4 module is available to expand inputs. Contact SELPRO customer service.*



Terminal		Description	Specifications
1	**IN1**	Analog Input 1.	V dc/m A/kΩ
2	**GND**	Grounding.	-
3	**+V**	Non-stabilized power voltage output for transducers.	22 V dc 10–20% Max 40 mA
4	**VR**	Stabilized voltage output for raziometric sensors and potentiometers. Switching between 5 V and 10 V is automatic according to the set configuration.	5–10 V dc Max 10 mA
5	**IN2**	Analog Input 2.	V dc/mA/kΩ
6	**GND**	Grounding.	-
7	**V**	Non-stabilized power voltage output for transducers.	22 V dc 10–20% Max 40 mA
8	**VR**	Stabilized voltage output for raziometric sensors and potentiometers. Switching between 5 V and 10 V is automatic according to the set configuration.	5-10 V Max 10 mA
9	**OUT**	Analog output for regulating EC motors. Settable with parameter **C7**. **(*)**	0–10 V/0.75–10 V Max 20 mA
10	**GND**	Grounding.	-

***NOTICE**: the same type of sensors must be connected to inputs **IN1** and **IN2**.*

***Note**: outputs **V+** and **VR** are protected against short-circuit to **IN1**, **IN2** and **GND**.*

***Note** (*): in applications where only switching spray units on and off is required, use the relay output (terminal M3).*

4.2.2 Analog inputs IN1 and IN2

Signals can be received from different types of transducers, sensors and controllers. The number of inputs and the prevalent input selection mode are automatically set when one of the configurations is loaded. The input that is not used for control remains visible on the display and RS485 Modbus port.

Note**: for special applications, it can be set from menu **conF** > parameters **C0** and **C1

4.2.3 Wiring diagrams

See "Connecting analog inputs in Slave mode" on page 25"Analog input connections in Master mode" on page 25 and "OUT analog output connections" on page 27.

4.2.4 OUT analog output control limits

The **OUT** analog output controls one or more EC motors (or power slave units, motorized actuators) with the 0-10 V signal. The number of slave units that can be connected is limited by the maximum current of 20 mA that can be supplied with the signal.

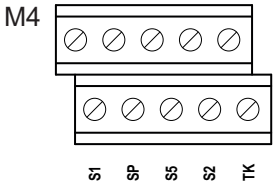
***Note**: the signal can range from 0.75 to 10 V dc as security in case of cable detachment or controller failure. It can be set from menu **conF** > parameter **C7**.*

4.3 On/Off inputs

4.3.1 Terminal board M4

Terminal board with On/Off inputs for remote commands or for reading overheat protections. Contact activity is indicated by On/Off input LEDs.

***Note**: these contacts activate some of the parameters in the default settings. They may vary for special customer needs. Refer to the project documentation.*



Contact	Terminal	Function
S1	**1, 2**	The function of this input depends on the value of the base parameter **icE** If **icE** = 0, it selects the direct/reverse mode: ■ closed: reverse regulation mode ■ open: direct regulation mode If **icE** > 0, it manages the motor heating function (antifreeze): ■ closed: antifreeze function on ■ open: antifreeze function off
SP	**3, 4**	Selects the set setpoint (base parameters **S1** or **S2**) ■ closed: setpoint 2 on ■ open: setpoint 1 on
S5	**5, 6**	Activates/deactivates the % RPM night limit (**Lh** base parameter) ■ closed: limit active ■ open: limit not active
S2	**7, 8**	Enables/disables the controller operation. ■ closed: turns off regulation, OUT analog output to 0 V (if **C7**= 0) or to 0.75 V (if **C7** = 1, 2, 3) ■ open: turns on regulation: the unit runs according to settings and inputs. ***NOTICE**: always use this input if the room temperature is below -10 °C. DO NOT use this input to replace the switch for individual fans or to replace the main power switch.*
TK	**9, 10**	Normally closed contact to connect motor overload protections. ■ closed: no alarm, consent to regulation ■ open: alarm, no consent to regulation ***NOTICE**: the overload protection of one or more motors or an alarm coming from an electrical cabinet can be connected to the TK input but must be normally closed logic.* ***Note**: with switch 3 = On (DIP switch SW1) the alarm is only readable by Modbus, the regulation consent remains and the relay remains energized.*

4.3.2 Forcing in the presence of Modbus connection

In the presence of a Modbus card, some of these inputs can be forced by supervisor. See "Modbus card (PB1073C) - optional" on page 19

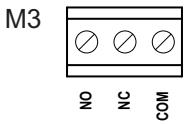
4.3.3 On/Off input wiring diagram

See "On/Off inputs connection" on page 27.

4.4 Relay output

4.4.1 Terminal board M3

The two-logic relay terminal board can be used to control spray units, alarm devices (i.e. sirens) or other external units.



Terminal		Description
1	**NO**	Normally open output (**NO**+**COM**).
2	**NC**	Normally closed output (**NC**+**COM**).
3	**COM**	Shared.

Note**: it can be set from menu **conF** > parameter **C6

4.4.2 Alarm signal settings

Alarms can be managed differently, for example, if a controller error occurs during regulation.

***Note**: if switch 3 = On (DIP switch SW1) in case of alarm the relay remains energized.*

4.4.3 Configuration for communicating operative statuses and malfunctions

It is possible to manage the operative (for example, if the regulator is in alarm) and fault (for example, insufficient power) states in different ways by setting DIP switch SW1 switches 5 and 6, see "Presentation" on page 12.

4.4.4 Relay wiring diagram

See "Relay output connection" on page 28.

4.5 Modbus card (PB1073C) - optional

4.5.1 Modbus RTU Architecture

The optional card with isolated transceiver for RS485 allows you to use the Modbus protocol to create a line of controllers connected to Clima-Sinergy or a third party supervisor.

4.5.2 Modbus card description

Part	Description
A	Serial Line termination jumper ■ **ON** (1-2): 120 Ω line termination on ■ **OFF** (2-3): 120 Ω line termination off
B	Modbus connections **(*)** ■ **D+**: non inverting RS485 ■ **D-**: inverting RS485 ■ **REF**: isolated transceiver reference grounding

***Note** (*): terminals with the same code are electrically connected.*

4.5.3 Forcing from a supervisor

The following can be forced from a supervisor:

- fan speed, via **OUT** analog output
- the commands on the On/Off inputs **S1**, **SP**, **S5**, and **S2**.

With switch 4 = Off (DIP switch SW1) the forcing automatically terminates after 10 minutes. The lit LED indicates the presence of one or more non-standard Modbus forcing.

***Note**: forcing can be canceled by a subsequent Modbus command or by turning off the controller or resetting it.*

4.5.4 Interrogation frequency from supervisor

***NOTICE**: to avoid malfunctions, limit the interrogation frequency to 1 Hz (one interrogation per second).*